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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Europe—and the Chemical Industry

No branch of industry is more directly concerned with the European situation—and with the German situation, because just now it is the centre of the European situation—than the chemical industry of this country. Germany is so predominantly a chemical nation, and its chemical operations are so entwined with those of other countries, that its recovery or collapse is a matter of vital concern to them, and especially to Great Britain. For one thing, this country has now a great chemical combine closely resembling in its structure and objects the German I.G. Farbenindustrie. Recent events in Europe, therefore, are naturally being closely watched by Imperial Chemical Industries. In the Summer Number of the *I.C.I. Magazine*, there is an able and judicial survey of the whole situation, which is well worth attention. The writer sums up the position crisply with the words "If Germany crashes, we all crash." That is the keynote of the review.

Beginning with President Hoover's proposal, the I.C.I. writer describes it as a perfectly simple one. It was that all payments on account of war debts should be suspended for one year. Judged purely from the economic point of view, the proposal must be regarded as a gesture which would have supplied a moral tonic to a sick world. "This is," the article proceeds, "no time to gloss over facts. If the gesture had met with an immediate and unanimous response, the moral effect would have been tremendous. But it was not immediate. The British Government accepted within a few hours. Italy followed, thereby demonstrating that whatever our private views about his political principles, Signor Mussolini is a statesman of the first order. France delayed her agreement. Her attitude is both understandable and deplorable. France fears Germany, and with good reason. Twice within fifty years, the very existence of France has been threatened by a vigorous and growing nation, drunk with the follies of militarism. But is fear to be still the main factor in international relationships? If it is, the end can only be ruin and terrible disaster for the human race."

Germans with whom the I.C.I. authority has talked are quite frank in their opinions. The two chief reasons for Germany's position are extravagance and reparations. The Germans have been spending and planning on the assumption that there was a good time coming, that they could expect 100 per cent. production and that there would be plenty of profits to pay for the expenditure on which they had embarked. The good time has not come and, far from being able to pay reparations, Germany can only be saved from collapse by her creditors. Imagine a similar state of affairs in this country and then add to the unpleasant picture the possibility that more than half the population desire a radical change in the form of government and are prepared to fight for that change on very little provocation. That is the situation in Germany. Fortunately the half which desires a change in government is divided into two parts, each having very different ideas as to the form of government. Ill fortune favours extremists—and it remains to be seen whether Hitlerites and Communists will cancel each other out.

"The Lesson for us" is thus summed up: "The situation on the continent provides an alarming warning which we should do well to heed. The results of extravagance are obvious. What is less obvious is the danger of political systems which encourage the growth of a multitude of parties. . . . We have said that we must face facts as we see them. The Chairman of I.C.I., speaking to the Society of Chemical Industry, put into plain language the fact that attempts to readjust money incomes to the level of the present disastrously low prices could result only in struggles and bitterness. The weight of the Macmillan Committee is behind this view. Some day the world will come to its senses and realise that efficiency, prosperity and contentment go hand in hand. But that is a long day off. In the meantime we shall slowly sink to the level of the East if we fail to take reasonable steps to protect our standard of living.

"That brings us to the vexed tariff question. Each of us has been over the arguments a hundred times and, if we have been impartial, have been swayed from one side to the other. The suggestion has been made that the tariff question, when agreed by the nation, shall be removed from the sphere of party politics and remitted to impartial experts. That suggestion, we believe, has everything to commend it. We live in a world which is changing rapidly. Let us live in the present and not in the past; let us judge the case on its merits, being influenced neither by political doctrines nor outworn traditions. If tariffs are necessary for the prosperity of British industry let us have tariffs, even if, in common with some members of the Macmillan Committee, some of us do not 'in a general way believe in tariffs.'"

"If," says the I.C.I. writer in conclusion, "the tone of this survey is serious it is because we should be doing a shameful thing if we attempted to gloss over the hard facts. But we are full of hope for the future. People are thinking. There is a general realisation that co-operation, unified control and bold experiment are the foundations on which the future must be built. The Hoover plan, the concerted effort to save Germany, the Macmillan report, give us greater hope than ever before that the policy of drift will be shamed out of existence. Difficult times are ahead, but the future is ours if we have the courage to work for it."

Oil from Coal Processes

In the debate on the coal situation in the House of Commons on Monday, Mr. Shinwell, the Minister of Mines, put the whole problem of the production of oil from coal in the simplest way. There are, he pointed out, between 200 and 300 processes for producing oil and their valuable residuals from coal, but apart from their technical variations the one defect common to them all is that they cannot be made to pay, at least at present. From the chemical and engineering points of view, the problem of actual production is already solved; what remains—and it is the final obstacle in all new chemical processes—is the difficulty of producing synthetic petrol at a price that will compete with that of the petrol now on the market. This difficulty is being increased by the recent keen price competition between petrol producers, for the cut prices at which it is now being extensively advertised are so low that there is no hope by the hydrogenation, or any other process, of producing petrol at even an adjacent figure. If, as the Minister points out, the parties interested in any process had good grounds for thinking that they could produce petrol at a sound competitive price, they could apply for a trade guarantee with a very good prospect of obtaining it. But no process has yet reached that stage, and the valuable scientific work and experiments that have been applied to this field are therefore, for the moment, not of much commercial importance. The investigations, however, have not been wasted. The established ability of this country to produce petrol from coal gives the country a new reserve source of liquid fuel in case of national emergency, and a process that, if and when the price of petrol reaches a certain level, may be put in commercial operation.

That, shortly, is the position in this country. It is much the same in the colonies, as the report of Dr. A. C. D. Rivett, an Australian expert, in his report to the Australian Government on his European mission, clearly shows. He came to the conclusion that the low-temperature distillation of black coal does not at present offer attractive economic possibilities in Australia. The preparation of crude oil by the hydrogenation of black coal is technically well developed but cannot compete economically on equal terms with natural oils from the earth. The low-temperature distillation of brown coal, in Dr. Rivett's opinion, merits attention as containing certain possibilities, and he is quite convinced that in order to keep down the costs of the finished product, the oil from coal industry, if developed at all, must be on a large scale. His final conclusion is that the initiation and development of an Australian industry, if practical, can best be effected by some such organisation as the proposed association of interests of Imperial Chemical Industries, the Standard Oil Co. (U.S.A.) and the German I.G.

Chemical Workers' Wages

The new agreement signed between the Drug and Fine Chemical Manufacturers Association and the National Union of Drug and Chemical Workers is a compromise that will be welcomed. Naturally, any reduction of wages will be regretted by the workers; on the other hand, with so many industries struggling to keep alive in conditions of abnormal difficulty, this is not the time for stoppage of works. The employers' original proposals for reduction were rejected as being too drastic; the amended terms were submitted to the workers in a second ballot and the result, although the Union executive's recommendation was that the terms were not acceptable, was a small majority in favour of acceptance. The agreement regulates the wages and conditions of some 20,000 male and female workers, and ensures the industry against any dislocation for some time to come.

In this connection the statement made by Sir Harry McGowan in the summer number of the *I.C.I. Magazine* is noteworthy. It must, he points out, be obvious to all that the company's attitude on the wages question must in the long run be governed by world conditions, but he announces, with obvious satisfaction, that the directors have decided to suggest to the Chemical and Allied Employers' Federation that the further reduction for shiftmen, which is to be considered by the Joint Industrial Council in September, should be withdrawn for the time being. It would be foolish to base any large inferences on this decision, but at least it appears to indicate a hope on the part of the I.C.I. directorate that matters in the course of the next few months may be at least no worse than they are now, and may possibly be better.

The Calendar

Sept. 14–15	Institute of Metals: Annual Autumn Meeting	Zürich.
Sept. 29–Oct 2	Iron and Steel Institute: Autumn Meeting.	Swansea.

The Flash Roasting of Iron Pyrites

By Horace Freeman

Mr. Horace Freeman is president of the Sulphide Research Corporation, Ltd., of Montreal, Canada. The following paper was presented at the Swampscott meeting of the American Institute of Chemical Engineers on June 11. Flash roasting has been developed more particularly for pyrites, but it has also been successfully applied in certain cases to zinc sulphide ores.

CONCENTRATION of base-metal sulphide ores by the flotation process has, during the past 20 years, received a very extensive development. The finely divided concentrates produced by the process have involved numerous changes in the metallurgical methods required for the subsequent handling, roasting, reduction, and other operations. From many mixed sulphide ores the flotation process has made available a concentrated by-product of iron pyrites ground to 200 mesh and even finer, containing 50 per cent. of sulphur and a minimum quantity of gangue material. When this high-grade product is roasted in the mechanical types of roasters at present in use—for example, the Nichols Herreshoff—it is found that, on account of the rapid roasting of the fine material and the greater amount of heat generated, the capacity of the roaster is considerably decreased and the wear and tear on brick work and rabbles, and the cost of roasting, are correspondingly increased.

The development to be described here arose out of a detailed consideration of the chemical engineering problems involved in introducing pyrite, and particularly the concentrated product, which is becoming available in Canada in considerable quantity, into the Canadian paper industry. It was felt that the investment in the Herreshoff roaster would be too large for the comparatively small requirements of the average paper mill, the operating costs would be excessive, the type of gas produced would not be suitable in the equipment used for the manufacture of sulphite acid, the yield of sulphur dioxide would be low, the fine red oxide produced would make an undesirable nuisance in a paper mill, and impurities in the pyrite, such as selenium, would cause trouble in the sulphite digesters. It was also felt that the existing methods of using sulphur in the paper mill would bear chemical engineering examination and that any process using pyrite successfully should also overcome the objections involved in making sulphite acid from brimstone.

Problems Involved

Experiments were initiated at Shawinigan Falls, involving the combustion of suspended particles in streams of air projected in various ways into combustion chambers. It was early found that preheating of the air was not necessary, except for the purpose of drying the pyrite. The best method of combustion of pyrite was found to be by injection with air downwardly into a vertical combustion chamber, in such a manner that only a part of the air needed for complete combustion was used to convey the pyrite, the remainder being caused to flow upwardly from the bottom of the chamber, countercurrent to the falling pyrite. In this manner the air entering from the bottom was preheated by the heated particles falling through it and the particles having the lowest sulphur content were meeting air with the highest oxygen content. Fresh particles of pyrite entering at the top were rapidly heated, distilling off an atom of sulphur which mixed and combined with any oxygen remaining in the gases passing out of the top of the combustion chamber, so tending to give the highest possible percentage of sulphur dioxide in the products of combustion.

One of the problems involved in the use of pyrite for sulphite acid preparation lay in sulphur trioxide formation which often, due to the presence of finely divided iron-oxide catalyst, might run considerably above the economic limits allowable. Investigation of the amount of heat generated in the early furnaces showed that higher temperatures could be developed than when burning the equivalent brimstone, and that these high temperatures could be utilised to minimise trioxide formation, since SO_3 is practically completely dissociated at 1,000° C. The necessity then arose to cool the gas rapidly down through the temperature range favourable to trioxide formation while the gases contained suspended iron oxide. Twice the amount of heat is developed, compared with burning the equivalent brimstone, and therefore it was felt that a steam boiler would serve as an efficient cooler and that the steam recovered would largely pay the operating expenses. The problem of further cooling the gases after passage through a steam boiler also was tied up with the necessity of washing the gas free from dust particles and other impurities, so that it would be suitable for the manufacture of sulphite pulp. Among the impurities objected to by the sulphite manufacturers is selenium, which is said to act as a catalyst in the sulphite digesters, forming sulphuric acid.

Paper Mill Practice

In the practice of burning sulphur in paper mills it is rare to find any consistent attempt to maintain high temperatures in the combustion chamber, nor is any attempt made to cool the gas as rapidly as the velocity of the oxidation reaction ($2SO_2+O_2=2SO_3$) requires. Gas usually is led through lengthy cast-iron ducts at a temperature favourable to sulphur trioxide formation before entering the externally-cooled lead coolers. There is no attempt made to wash the gas free from the trioxide which forms, but a certain quantity of condensed sulphuric acid is run off from the bottom of the lead coolers. The remainder passes on into the limestone absorbers, there to form calcium sulphate crusts.

In Canadian paper mills, the efficiency of conversion of brimstone to available sulphur dioxide varies from 80 per cent. to 95 per cent., according to the equipment and method of operating the burners. The sulphur consumed per ton of pulp may vary over wide limits (from 200 lb. to 350 lb. per ton of pulp), due to the gas losses mentioned above, as well as other losses. If we refer strictly to conversion of sulphur to sulphur dioxide, it is rare that we find a small paper mill installation consuming, say, 10 tons of sulphur per day which attains the efficiency of sulphuric-acid plants using larger quantities and reaching sometimes 96 per cent. efficiency. This problem, therefore, was particularly considered in connection with small pyrite installations. Electrical methods of cleaning the gases were costly for small installations, and since any trioxide and selenium in the gases could be removed by washing, for final cooling after the boiler direct scrubbing was adopted, particularly as the set-up would be cheaper than the usual lead cooler.

The Flash Roasting Process

The pyrite preferred for the process is flotation pyrite dried down to about 2 per cent. or 3 per cent. moisture content and containing 50 per cent. or so of sulphur on the dry basis. It has been determined, however, that the ordinary large-lump pyrite, containing 45 per cent. sulphur, can be quite successfully used. The material is fed from the storage hopper into a ball mill, which serves as a dryer, as a grinder, and to bring the sulphide into suspension in the air. In the case of lump pyrite, the full charge of balls is used in the mill, but in the case of flotation material a very light charge of balls is used, since it is necessary only to break up any agglomeration. As was previously stated, warm air is passed into the mill to carry out the material brought into suspension, which passes through the fan and then into the primary combustion chamber. In this chamber the temperature is maintained above 1,100° C. in the middle zone, but the temperature of the burning particles is much higher than this. This accounts for a very rapid and complete removal of the sulphur from the particles, which fuse while falling through the atmosphere of the chamber.

Ordinary firebrick construction is used for the walls of the chamber. When the chamber is of the correct dimensions, no fluxing of the material on the walls is experienced, although, in our early experiments and in the experiments of others, a great deal of trouble was encountered from the formation of slag, or scarf, on all sides of the chamber. This has been found to be due to the attempt to burn too much material per unit of time and unit of volume in the chamber, a difficulty which greatly delayed the development of powdered-coal combustion methods. In other words, slag or crust formation in this chamber has been overcome by enlarging the combus-

tion space. A crust of only about ½ in. thickness forms on the walls, and as the sulphur is practically completely removed from this, it does not slag but continually falls off and is renewed.

Cooling and Washing the Gases

The gases pass downward into a second combustion chamber and their temperature, at the entrance to the boiler tubes, is in excess of 1,000° C. The velocity through the boiler tubes is so high that the tubes are self-scouring and the rate of cooling is very rapid. The rapid cooling of the gases from above 1,000° C. to below 400° C. accounts for the almost total freedom of the gases from sulphur trioxide, even though there is a considerable quantity of free oxygen and gas-floated catalytic oxide present. The gases leave the boiler at about 200° C. and contain 0·1 per cent. sulphur trioxide. At this temperature and concentration there is no condensation on the boiler surfaces.

Still at this temperature, the gases enter the final cooling and washing tower, packed with acid-proof spiral tile filling, over which is sprayed just the amount of water necessary to cool the gases to within 10° of the water temperature. This water, in its passage down the tower, washes out the dust and dissolves traces of sulphur trioxide as well as other impurities. In doing so it becomes heated, so that when it discharges at the bottom of the tower its temperature is from 70 to 80° C. The dimensions of the washing tower and the quantity of water used in it are, of course, proportional to the volume of gases to be handled and their entering temperature.

The boiler and the washing tower together comprise the cooling system and are the equivalent of the lead-pipe externally cooled systems which are at present used on brimstone installations. It has been found that this cooling system is cheaper to install and to operate, and that there is a difference of at least 3 to 5 per cent. in the efficiency of sulphur conversion to sulphur dioxide by such rapid cooling. Here it may again be remarked that the temperatures developed by pyrite are considerably higher than those developed in the present practice of handling sulphur, and this is a factor in preventing the initial formation of trioxide.

Sulphur Losses

About 0·5 per cent. of the total sulphur used is lost as trioxide, and about 0·5 per cent. as dioxide in the scrubber water. The remaining sulphur lost is in the calcine, and this loss has been reduced to 0·2 per cent. of the weight of the calcine, making a total sulphur loss of 1·38 per cent. Steam yield from the boiler exceeds 1 lb. of steam per pound of pyrite consumed, which pays the cost of operation of the burner. The oxide produced is in the form of fused particles or hollow shells of magnetite, containing about 65 per cent. of iron. It contains the gangue material ordinarily produced in flotation concentrate, of course, but it is being found that most of this can be eliminated by magnetic separation, and that the sulphur content, as consistently produced, is below 0·2 per cent. This material is especially interesting as a high-grade iron ore, free from phosphorus and low in sulphur. It may be sintered or briquetted. It is even more interesting as a raw material for sponge-iron production, to be directly smelted in electric furnaces without the usual cooling of the iron powder and magnetic separation between the reducing kiln and the electric furnace.

Nitrate Conference in Brussels

DELEGATES representing the nitrate industry from Belgium Germany, France, Holland and Italy have recently held a secret meeting in Brussels to examine the situation which has resulted from the denunciation of the nitrogen cartel. The fact that Chile was not represented, although invited, recalls the collapse of the World Nitrate Conference, at Lucerne, on July 16. As the result of an emergency decree which Germany promulgated putting a prohibitive duty on all Chilean nitrates, the Chilean delegates immediately withdrew from the conference. It is stated that the delegates at this conference were unanimous with regard to the basis of a series of private agreements which will be submitted later for the approval of the various countries interested. As soon as a majority of the European producers have ratified the agreement, negotiations will be resumed with Chile.

Chemical Fertilisers in Egypt

Present Market Conditions

A REVIEW of the present market conditions for fertilisers in Egypt appear in a recent issue of *Le Phosphate et les Engrais Chimiques*, which is published in Paris. In this article it is pointed out that Egyptian farmers are now realising the need for chemical fertilisers to increase the output from the soil and for intensive cultivation, and as the alluvial soils of Egypt are relatively poor in nitrogen and in phosphorus the demand is chiefly for sodium nitrate and superphosphates. Much calcium nitrate is also used and a certain quantity of ammonium sulphate.

A Wide Range of Imported Material

Egyptian production of fertilisers for home consumption is not of any great extent. Nitrate schist ("tafla") is obtained in Upper Egypt and is utilised just as it is on the spot. Two companies exploit the large beds of phosphates between Kosseir and Sebaia, but export the whole of the product, mainly to Japan and Italy. At Suez a small factory also manufactures low quality superphosphates. The importation of Chili saltpetre began 30 years ago and rapidly increased until in 1929 it had become about three times as great as that of other nitrogenous fertilisers and 50 per cent. of the total imports of fertilisers. German calcium nitrate is the most serious rival of saltpetre and in 1928 supplanted the Norwegian calcium nitrate owing to its higher nitrogen content. English "nitro-chalk" and French calcium nitrate have also appeared on the market, the latter in considerable quantities. Since 1925 the importation of ammonium sulphate has greatly diminished. Calcium cyanamide has not been very successful in spite of its low price, and although the use of sulphonitrate of ammonia increased considerably in 1929 compound fertilisers are still little known and are not expected to increase in the near future. The importation of superphosphates on the other hand will probably continue increasing because Egyptian soils are for the most part alkaline. They are applied principally to leguminous vegetable (beans, peas, lentils, etc.) and to cotton. Potassium fertilisers, which are still little used, are supplied by the Franco-German Syndicate.

The following table gives a summary of the imports and exports of fertilisers (in tons) from 1927 to 1929 :—

	1927	1928	1929
IMPORTS :			
Sodium nitrate	142,299	188,077	193,125
Calcium nitrate	33,519	39,886	64,795
Ammonium sulphate	2,952	4,480	2,590
,, sulphonitrate ..	1,046	555	3,481
Calcium cyanamide	1,406	2,093	1,662
Superphosphates	43,833	39,206	60,532
Various fertilisers	375	1,013	1,678
Total ..	225,430	275,370	327,863
EXPORTS :			
Natural phosphates	274,326	168,792	216,571

Need for Quick-Acting Fertilisers

The fact that Egyptian growers want quick-acting fertilisers favours nitrogenous fertilisers at the expense of phosphates. The advantages of the latter must therefore be demonstrated in order to develop the market for them. On the other hand, increased acreage under cultivation and increased use of chemical fertilisers are making it necessary to import increasing quantities and it may be expected that in a few years the annual consumption will reach about 400,000 tons of nitrogenous fertilisers and 100,000 to 150,000 tons of superphosphates.

International Congress for Testing Materials

A FIRST international congress has been instituted by the new International Association for the Testing of Materials, to be held in Zürich, September 6 to 12. The technical programme has been divided into the four groups : metals, non-metallic inorganic materials, organic materials, and questions of general importance. Americans who will take part in the proceedings include Prevost Hubbard, of the Asphalt Institute ; C. S. Reeve, of the Barrett Co. ; Lincoln T. Work, assistant professor of chemical engineering, Colombia University ; H. F. Moore, University of Illinois ; and W. H. Fulweiler, of the United Gas Improvement Co.

Corrosion of Iron and Steel

A Notable Report

GREAT attention continues to be concentrated upon the subject of corrosion, and especially the protection of iron and steel, a subject of particular importance for the chemical and allied industries. The latest addition to the huge bibliography that has grown up on the subject is the " First Report on the Corrosion of Iron and Steel," presented at the recent annual meeting in London of the Iron and Steel Institute. This is a document, 250 pages in length, containing 21 plates and 78 other illustrations, being the report of the Joint Committee of the Iron and Steel Institute and the National Federation of Iron and Steel Manufacturers.

Essentially, as a preliminary to other reports, an attempt has been made to summarise the available knowledge and data concerning rust and corrosion, while there is also included a detailed digest of the replies received from a questionnaire sent out to producers and consumers of iron and steel, giving their experiences of the corrosion of ferrous products.

It is well-known, of course, that the figures for the destruction of steel by rust and corrosion are of an astounding character, and probably about 48,000,000 tons of steel are lost every year from this cause alone, representing 40 per cent. of the world production of steel (ingots and castings). The report states, however, that a striking result of their investigations to date, and especially as regards the replies to the questionnaire, is that steel, if properly protected, will last for a very long time.

In this connection one of the most valuable methods is the use of red lead paint, which in addition to forming a strongly adherent protective film, highly resistant to such deleterious influences as oxygen, moisture, carbon dioxide, the sun's rays, salt, and stray electric currents, has a pronounced " inhibiting" action. In fact, there is no real substitute for red lead paint, which, as regards iron and steel, occupies the same position as white lead paint for woodwork. Every description of steel structure can be protected in this way against rust and corrosion, not only for example, structural steel in buildings, bridges, railways, docks and harbours, lighthouses, ships, power stations, gasholders, oil tanks, and pithead gear, but also chemical plant of all kinds.

In addition, red lead paint is extremely valuable for painting iron and steel embedded in concrete. There is now used for the purpose special non-setting red lead, so that the paint will keep on storage in containers and can therefore be supplied in bulk. Essentially red lead of this character, made by the oxidation of molten lead with air in two stages at not over 645° F. and 1000° F. respectively, with very accurate control, contains not less than 94 per cent. Pb_3O_4 (plumbic tetroxide) and 99½ per cent. total oxides of lead, with not over 6 per cent. lead monoxide (PbO). Under these conditions no setting or semi-hardening of the linseed oil takes place which is due to an excessive amount of lead monoxide, and it is no longer necessary to make small amounts of paint at a time in order to obtain the benefits of red lead.

Complaint of Factory Fumes

Writ against an Artificial Silk Company

MR. JUSTICE CLAUSON, in the Chancery Division on Wednesday, July 29, directed that a writ of sequestration be issued against the Rayon Manufacturing Company (1927), Ltd., whose artificial silk factory is at Ashtead, Surrey. The writ was obtained by the Epsom Rural District Council, who alleged that fumes from the factory constituted a public nuisance. An injunction restraining the defendants from emitting fumes from the factory was obtained in 1928, when the defendants submitted to judgment, but residents in the district, it was stated, complained that fumes still constituted a public nuisance, and the writ of sequestration was issued to enforce compliance with the Court's order.

Mr. Justice Clauson directed that the writ should lie in the office until October 31, the defendants to pay £1,500 as security for the plaintiffs' costs in the action. His Lordship said he realised that in all probability the issue of the writ would have the effect of forcing the defendants to shut down their factory, or part of it, and might involve throwing out of work a large number of employees, but the time had arrived when the previous order of the Court must be obeyed.

Chemical Matters in Parliament

Civil Service Estimates, 1931-32

THE following items are extracted from the Civil Service Estimates voted in the House of Commons on Tuesday last, July 28, in respect of the year ending March 31, 1932 :—

	£
Government Chemist	42,894
Royal Commissions, etc.	21,040
Empire Marketing	459,000
Colonial Development Fund, etc.	348,342
Board of Education	29,862,377
Scientific Investigation, etc. (Education)	135,684
Universities and Colleges	930,000
Department of Health	1,607,203
Board of Trade	100,115
Department of Overseas Trade	280,507
Export Credits	90
Ministry of Agriculture and Fisheries	1,345,152
Beet Sugar Subsidy	2,225,000
Forestry Commission	595,000
Department of Scientic and Industrial Research	271,004
Australian Zinc Concentrates	287
Scientific Services (Navy)	482,500

Conversion of Coal into Oil

Its Present Economic Possibilities

A DISCUSSION on the claims of oil and coal as national fuels took place on Thursday, July 16, at the Great Central Hotel, under the auspices of the Fuel Committee of the Society of Chemical Industry, Dr. E. W. Smith presiding.

Dr. Lander, director of the Fuel Research Station, said that under present conditions it would be impossible to convert coal into oil in order to compete on a cost basis with natural oil, except to the limited extent to which it was possible to obtain oil as a by-product of a process. Hydrogenation held the most promising future. It was now possible to obtain 130 gallons of motor spirit from one ton of suitable coal ; but even so, it could not compete with the present world prices of petrol.

Dr. A. E. Dunstan, chief chemist of the Anglo-Persian Oil Co., said the vast over-production of oil in the world to-day, coupled with the startlingly low prices in the United States, was due to the efforts of the technical people. Technical minds were responsible for getting this greater output with less labour, and for the consequent unemployment.

Mr. K. Gordon, in giving the first description of the results of the hydrogenation process at Billingham-on-Tees, said that the treatment of bituminous coal by this process did not offer any engineering difficulties greater than those already overcome in the case of tar and heavy oil. The choice between coal and tar, both high and low temperature, as raw materials for an indigenous petrol supply rested entirely upon economic conditions at the time. It would not pay to carbonise coal intended for industrial purposes, such as the generation of electricity.

Drug and Fine Chemical Workers

A New National Agreement

A NEW agreement has been arrived at and signed between the Drug and Fine Chemical Manufacturers' Association and the National Union of Drug and Chemical Workers that will regulate until further notice wages and conditions of 20,000 male and female workers.

The original terms of the employers' proposals, involving wage cuts as high as 8s., 12s. and 16s. per week, were rejected by the workers in a ballot wherein they declared 4 to 1 in favour of stopping work on June 22 in favour of the Union's counter terms. The employers modified their wages proposals, reducing wage changes on old agreements to: men 3s., women 2s., juniors 6d. to 2s. 6d. These revised terms were submitted to the workers in a second ballot, which resulted in a small majority in favour of acceptance in spite of the Executive Council's recommendation that the terms were not acceptable.

The new wages under the new agreement are : Men, Grade 1, 60s. ; Grade 2, 55s. ; Grade 3, 50s. ; Women, Grade 1, 34s. ; Grade 2, 28s. 6d. per week.

All agreements hitherto between the Employers' Association and the Union have been variable. This new agreement requires six months' notice to change its terms.

From Week to Week

RECENT WILLS include :—Mr. Sigmund Selby, 18, Dunbar Road, Bournemouth, retired printing ink manufacturer, £32,291.

DR. R. H. HOPKINS, lecturer in bio-chemistry in the chemistry department of the Heriot-Watt College, Edinburgh, has been appointed to the Adrian Brown chair of chemistry and brewing in the University of Birmingham.

LORD TRENT, chairman of the board of Boots Pure Drug Co., Ltd., of Nottingham, has been elected a director of Drug Incorporated, which controls Boots Pure Drug Co., Ltd., through the United Drug Co., of Boston, U.S.A.

JONES BROS. (WEST BROMWICH), LTD., chemical manufacturers, were recently summoned at West Bromwich for failing to provide sufficient and suitable bath accommodation at their works. A fine of £7, with 6s. costs, was imposed.

THE FUSTIAN DYEING AND FINISHING WORKS at Hoo Hole, Mytholmroyd, have been reopened, and a number of workmen transferred there from the combine firm's works at Stubbing Holme, Hebden Bridge. The re-starting of this old-established dye works is being welcomed in the district.

URANIUM ORE, assaying over 58 per cent. uranium oxide, with an estimated value of £2,000 per ton, is reported to have been discovered by Mr. T. G. Donovan, a noted Detroit geologist, on the occasion of his prospecting visit to the Great Bear Lake, near the Arctic Circle, in Northern Canada.

MR. MICHAEL M. HALLETT, of Penarth, who recently obtained his degree in metallurgy at the Cardiff University, has been awarded an industrial bursary by the Royal Commissioners for the Exhibition of 1851, and has been offered an appointment in the research department of the Mond Nickel Co., Birmingham.

DR. FRANZ FISCHER of the Coal Research Institute, at Mülheim, Germany, has perfected a process for the removal of carbon monoxide from coal gas by passing the gas through sewage sludge. Bacteria present in this sludge removes the carbon monoxide and recombine the carbon and hydrogen, returning it to the gas as methane, which has a high fuel value and is not poisonous.

A SUPPLEMENTARY ESTIMATE for £225,000 for the Ministry of Agriculture and Fisheries was issued on Saturday, July 25, in respect fof the beet sugar subsidy. The original estimate provided for £2,150,000, but the revised estimate is one of £2,375,000. This extra amount is required to make provision for additional payment on sugar manufactured from beet grown in Great Britain in respect of the special advance, contingently repayable, under the provisions of the British Sugar Industry (Assistance) Bill, 1931.

THE ANNUAL MEETING of the Iron and Steel Institute will be held at Swansea, from Tuesday, September 29, till Friday, October 2, inclusive. Included in the programme are visits to the National Oil Refineries of the Anglo-Persian Oil Co., Ltd., at Llandarcy; the Swansea Vale Spelter Works of the National Smelting Co., Ltd.; and the Courtybella Works of the Whitehead Iron and Steel Co., Ltd. Further particulars may be obtained on application to the Secretary, Iron and Steel Institute, 28, Victoria Street, London, S.W.1.

THE GRAVITY OF PRICE CUTTING carried on by the leading producers of artificial silk was pointed out by Sir Charles Mandleberg, chairman of Harbens (Viscose Silk Manufacturers), Ltd., at the annual meeting of shareholders in Manchester on Monday, July 27. Selling prices, he said, were too low, and therein could be found the crux of the difficulty with which the rayon producing industry had to contend. The process of elimination under the stress of circumstances was reducing the number of rayon producing firms in this country.

EXPERIMENTS have recently been made in the port of Liverpool in cheapening the cost of handling of granulated nitrate of soda. Hitherto the use of elevators has been confined to grain cargoes, but now with increasing quantities of nitrate coming forward in granulated form, it seems they may be readily and successfully adapted to deal with this class of cargo. A recent consignment of 500 tons of nitrate was lifted from the ship's hold by means of a powerful elevator, and as a result of this innovation, a considerable saving in both time and money was effected.

DR. AND MRS. LEVINSTEIN, who left for the Continent directly after the chemical jubilee meetings in London, are now staying at Genoa.

AN AMERICAN CONCERN which recently secured a concession from the Panama government for the exploitation of the palm nut resources of that Republic, is contemplating the erection of a factory in Panama City.

THE BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION is inviting applications for the post of research metallurgical analyst, further particulars of which will be found in the Classified Advertisement Section of this issue of THE CHEMICAL AGE.

CHEMISTS AND ENGINEERS with experience in the manufacture of acetate silk are required for a new artificial silk factory commencing operations in England. Further particulars are given in the classified advertisement Section of this issue of THE CHEMICAL AGE.

A NEW UNIT of the plant of Courtaulds (Canada), Ltd., at Cornwall, Ontario, was completed recently, and announcement has been made that, as a result of the increase in tariff protection, the company's production of artificial yarn will be enlarged by 60 per cent. by the end of August.

A DISPLAY OF MANUFACTURES in which Monel metal is employed has been organised by Monel-Weir, Ltd., and a number of Glasgow and West of Scotland manufacturers, and by co-operation of the Canadian Exhibition Commissioners is being shown in the windows of the Canadian Government's offices in Hope Street, Glasgow.

AT THE FINAL SESSION of the Imperial Sugar Cane Research Conference, on Friday, July 24, the establishment of a chain of four central cane-breeding stations to assist the Empire's sugar industry was recommended. Barbados was selected as the site for a cane-breeding station in the West Indies. The three other cane-breeding centres would be located in India, Mauritius and Australia.

FOLLOWING the recent London exhibition of British chemical plant, it has been agreed that similar exhibitions in Great Britain, France and Germany shall be organised and advertised in close collaboration. This scheme was originated by France, who will hold her next exhibition in 1932. Germany will follow with the Achema in 1933, and Britain hopes to repeat this year's success in 1934.

THE ESTATE OF THE LATE LORD MELCHETT has been sworn at a gross value of just over £1,000,000. Duty will be paid upon a net value of just under £200,000. These figures, however, do not include land owned in Palestine and works of art exempt from duty, the value of which is estimated to be between £250,000 and £500,000. Lord Melchett made no charitable bequests, in view of the fact that he had been a generous donor to charitable and scientific institutions during his lifetime, and had also interested himself in the economic and cultural development of Palestine.

IN THE HOUSE OF COMMONS on Wednesday, July 24, Sir Cooper Rawson (Brighton) introduced a Bill to make compulsory the equipment of British ships with separators for freeing from oil the liquid discharged therefrom and generally to make provision against the pollution of the seas by oil. Such separators worked automatically, and the cost of upkeep was said to be negligible. They have already been adopted by certain ships in the Navy and by most of the Cunard, White Star, Elder Dempster and Union Castle lines. It is estimated that 2,000,000 tons of crude oil are poured on the sea every year.

CANADIAN INDUSTRIES, LTD., which is closely related to Imperial Chemical Industries, Ltd., of Great Britain, and E. I. du Pont de Nemours and Co., of the United States, is to build a $1,500,000 plant at Three Rivers, Quebec, for the manufacture of "cellophane." This new industry for the Dominion has been made possible by the recent tariff changes, which included an increase in the duty on regenerated cellulose from 5 to 10 per cent. under the General Tariff, with provision for a further increase to 35 per cent. by Order in Council when the Government is satisfied that the product is being manufactured in Canada in quantity and quality sufficient for Canadian requirements. It is reported that the Canadian consumption of cellophane has already reached a volume which will support the manufacture of the product in Canada, which will also provide a new market for wood pulp.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

347,164. PURIFYING MINERAL OILS; MINERAL OIL SULPHONATES. W. T. Reddish, 3043, Daytona Avenue, Cincinnati, Ohio, U.S.A., and L. D. Myers, 1521, Carolina Avenue, Cincinnati, Ohio, U.S.A. Application date, October 18, 1929.

Sulphonated mineral oil is extracted with an aqueous solution of an organic solvent so that the concentration of the sulphonates is less than 20 per cent. by weight. Aqueous alcohol of 45–50 per cent., or 65–70 per cent. concentration is suitable. The sulphonic acids are oil-free and are emulsifying and fat-splitting agents. An example is given.

347,182. DEHYDRATING CHLORIDES. Soc. de Produits Chimiques des Terres Rares, 129, Avénue de Champs Elysées, Paris. International Convention date, January 18, 1929.

Magnesium or cerium chloride is partly dehydrated by sudden heating by contact with a metal plate heated to 400°–500° C. Calcium chloride present as an impurity is removed by adding excess of the hydroxide, but 0·05–0·5 per cent. may be retained in order that the final porous product may not be too friable. The product may be used to obtain the metal by electrolysis.

347,208. NICKEL CARBONYL. Mond Nickel Co., Ltd., Imperial Chemical House, Millbank, London, and C. M. W. Grieb, Cwmdwr Clydach, Swansea. Application date, January 16, 1930.

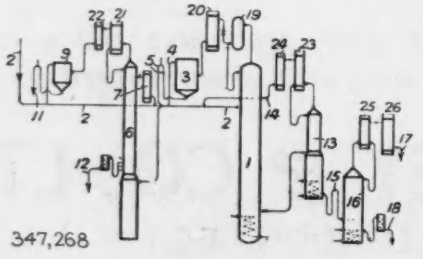
In the formation of nickel carbonyl from nickel or from reduced ores or mattes, the rate of formation of nickel carbonyl is increased by the presence of a compound containing active sulphur, selenium or tellurium but not in sufficient quantity to have a deleterious effect on the carbonyl formation. Nickel sulphide or a sulphide capable of reduction by carbon monoxide to yield carbon oxysulphide, or which will cause the liberation of hydrogen sulphide, sulphur dioxide or trioxide may be added before or during reduction, or nickel sulphide or a sulphide reducible to yield carbon oxysulphide may be added after reduction. Alternatively, small quantities of sulphur-containing gas may be added. The reduction of the matte is effected below 500° C. A number of suitable compounds which may be added are specified.

347,223. SILICA. I. P. Llewellyn, T. J. I. Craig, A. Kirkham, and P. Spence and Sons, Ltd., National Buildings, St. Mary's Parsonage, Manchester. Application date, January 24, 1930.

Silica in a light form is treated with a magnesium salt such as the chloride, sulphate or bicarbonate to precipitate magnesia on the silica. The product is filtered, washed and dried, and is suitable for use as a heat insulator.

347,268. DEHYDRATING AND PURIFYING ALCOHOL. G. B. Ellis, London. From E. Merck, Darmstadt, Germany. Application date, January 24, 1930.

A mixture of alcohol, benzene and water passes through pipe 2 into a column 1, and a mixture of these with the low-



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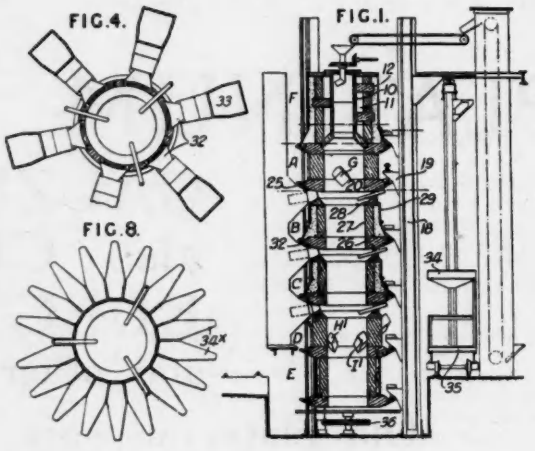
boiling impurities passes through condensers 19, 20 to a separator 3, from which benzene is drawn off by pipe 4 to the pipe 2. The remaining mixture passes by pipe 5 to a rectified 6 from which fusel oil is drawn off at 12, and alcohol through a cooler 7 to pipe 2. The low-boiling impurities pass through condensers 21, 22, to a separator 9. The alcohol and higher-boiling impurities pass from column 1 to column 13, any benzene being condensed in 23, 24 and returned to pipe 2. Alcohol passes to a column 16, and its vapour is condensed in 25, 26, high-boiling impurities being drawn off at 18.

347,239. ZINC OXIDE. W. W. Triggs, London. From St. Joseph Lead Co., 250, Park Avenue, New York. Application date, December 17, 1929.

Granular sintered zinc ore and granular carbonaceous material are introduced into a shaft furnace and the charge is heated by the passage of a current through it to about 1100° C. sufficient to distill the zinc but not sufficient to fuse



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or slag the residue. The furnace consists of a number of independently supported sections A, B, C, D, with a preheater section F and discharge section E. The support for each section consists of an annular ring of brickwork 26 supported by a metal ring 25 which is suspended by insulated rods 20 from a bracket 19. The sections B, C, D, F are provided with casings 29 packed with powdered chrome ore. Condensers 34^x, Fig. 8, are luted into the space between the rings 26, 28 to receive the metal, or tuyeres 32, Fig. 4 leading the zinc vapour to oxidising conduits 33. Three electrodes such as G, pass into the section A and corresponding electrodes such as H^1, I^1, into the section D, so that the current passes diagonally through the charge. The preheater F is heated by combustion products passing through the flue 11. A rotating discharge table 36 is provided.

347,326. FERTILISERS CONTAINING DICALCIUM PHOSPHATE AND AMMONIUM SULPHATE. H. Oehme and Chemische Fabrik Kalk Ges., 1, Kalker Hauptstrasse, Kalk, near Cologne, Germany. International Convention date, February 7, 1929.

Superphosphate is treated with ammonia at a low temperature, and the product treated at 35°–55° C. with ammonium carbonate or bicarbonate or their constituents in the presence of a small quantity of water. The two reactions may be combined into one process. If the quantity of water is small, the product is readily distributed.

347,380. DESTRUCTIVE HYDROGENATION; MOTOR SPIRIT. D. A. Howes, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, February 28, 1930.

Ethane and methane are obtained from destructive hydrogenation gases by absorption in petrol or gas oil under pressure and are released by reducing the pressure. These gases are passed through a refractory tube heated to 1000°–1200° C.

several times until a pyrolysis spirit is obtained, which is then desulphurised, etc., by treatment with caustic soda, sulphuric acid and fractional distillation. The product is added in the proportion of 1 : 54 to a liquid fuel obtained by destructive hydrogenation to render it non-knocking. The waste gases from the pyrolysis process are treated with steam to obtain hydrogen for the destructive hydrogenation.

347,149. ALUMINIUM COMPOUNDS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 24, 1930.

Alkali metal aluminates are treated with aqueous solutions of aliphatic dicarboxylic or hydroxy carboxylic acids containing less than six carbon atoms to obtain complex aluminium compounds. Examples are given of the preparation of oxalates containing sodium or potassium and aluminium, tartrates containing sodium and potassium or calcium and aluminium, and lactates containing sodium and aluminium.

347,099. DYES. F. Bensa, 68, Via Serra, Genoa, Italy. International Convention date, January 9, 1929.

The chloride of perylene-3 : 9-dicarboxylic acid is heated in nitrobenzene with β-aminoanthraquinone, α-aminoanthraquinone, 1 : 5-diaminoanthraquinone, 1-chlor-4-aminoanthraquinone, 1-chlor-2-aminoanthraquinone, or 1 (2) : 12 (11)-diamino-perylene-3 : 10-quinone to obtain vat dyes which dye cotton yellow to brown shades.

347,100. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 16, 1929.

The α-amino derivatives of the diphthaloyl-carbazole from 1 : 1^1-dianthrimide are condensed with Bz1- or 2-halogenbenzanthrones and the products further condensed by means of alcoholic potash, fused potash, sulphuric acid or aluminium chloride. Examples are given of the treatment with alcoholic potash of the condensation products from 4 : 4^1-diamino-1 : 1^1-anthrimido-carbazole and Bz1-brombenzanthrone, 4 : 5^1- and 5 : 5^1-diamino-1 : 1^1-anthrimido-carbazoles and Bz1-brombenzanthrone, 5 : 5^1-diamino-1 : 1^1-anthrimido-carbazole and 2-chlorbenzanthrone, 5-amino-4^1-benzoylamino-1 : 1^1-anthrimido-carbazole and 2 : 7-dichlorbenzanthrone, and others.

347,101. NITROPHENOLS, ALDEHYDES AND ACIDS. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 17, 1929.

Nitrobenzaldehydes, nitrobenzoic acids, nitrophenols and their salts such as sodium-*p*-nitrophenolate and sodium 2 : 4-dinitrophenolate are rendered less inflammable by adding organic acid amides such as acetamide, urea and urethane.

347,113. DYEING. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 20, 1930.

A diazo compound of an unsulphonated aromatic or heterocyclic amine, or a derivative not containing substituents inducing solubility in water, is coupled on the fibre with an arylide of the 7-hydroxy-6-carboxylic acid of α-naphthocarbazole The latter are made from the acid and the desired amine in toluene in presence of a water-fixing agent. In an example, cotton is impregnated with the *o*-toluidide and developed with diazotised 2 : 5-dichloraniline.

347,426. SODIUM HYDROXIDE, SODIUM CYANIDE, AMMONIA AND AMMONIUM CHLORIDE. A. Mentzel, 2, Nordsternstrasse, Schöneberg, Berlin. International Convention date, March 26, 1929.

In the ammonia-soda process, sodium bicarbonate is converted into sodium cyanide by means of carbon and nitrogen at a temperature of 1000° C. The cyanide is removed and treated with steam at 400°–500° C. to obtain caustic soda and ammonia, the latter being used to saturate the ammonium chloride liquor before treatment with carbon dioxide. Ammonium chloride is obtained by cooling the solution. Carbon dioxide is obtained by heating the sodium bicarbonate.

347,510. PURIFYING ALUMINIUM CHLORIDE. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 26, 1930.

Anhydrous aluminium chloride containing iron compounds is converted into a liquid compound with phosgene, and during this treatment or prior to it the ferric chloride present is reduced to ferrous chloride by means of iron or aluminium. The mixture is then treated with chlorine to reform and precipitate ferric chloride which is separated, and the aluminium chloride then recovered by evaporating the phosgene.

347,592. SPLITTING FATS. Naamlooze Vennootschap Chemische Fabriek Servo and M. D. Rozenbroek, Delden, Twente, Overijsel, Holland. International Convention date, January 22, 1929.

Aliphatic carboxylic acids containing at least 12 carbon atoms in the molecule or their derivatives are sulphonated in the presence of aliphatic-oxy sulphonic acids, sulphuric esters or salts. Before the sulphonation hydrocarbons which condense with the fatty acids, *e.g.*, xylene, toluene, naphthalene, or hydrogenated products may be added. The fatty acids may be partly sulphonated before adding the oxy-sulphonic acids or they may be converted into the anhydrides or chlorides before sulphonation. Examples are given of the sulphonation of castor oil, the fatty acids of castor oil, linseed oil, and various other oils and fatty acids, to obtain fat splitting agents.

347,593. CATALYSTS. Holzverkohlungs-Industrie Akt.-Ges., Constance, Baden, Germany. International Convention date, January 29, 1929.

Aliphatic monohydric alcohols, aldehydes or their polymers, acids, esters, acetates, and aldols, containing two or more carbon atoms, are treated with water vapour at elevated temperatures in the presence of catalysts consisting of oxides, or carbonates of nickel or cobalt, which may be mixed with other oxygen compounds of metals of the 6th, 7th, or 8th groups, or oxides of metals having a specific gravity less than 5·5, particularly the alkaline earths. A metal such as iron may be employed as a carrier. In an example, rusted iron sponge is moistened with acetic acid and saturated with a solution of nickel carbonate in acetic acid, dried, and heated to 500° C. This catalyst may be wholly or partly oxidised before use, with air, oxygen or water vapour.

347,601. PRODUCING A NITROGEN HYDROGEN MIXTURE FOR AMMONIA SYNTHESIS. D. Tyrer, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, January 28, 1930.

In a coke cooling plant the hot coke is treated with water and air, and the gases are passed without condensation of steam to an apparatus in which the carbon monoxide is subjected to a catalytic reaction with steam to obtain the equivalent quantity of hydrogen. The steam is obtained partly or wholly from the coke-cooling operation. The product is a mixture containing nitrogen and hydrogen in the ratio of 1:3.

347,641. ALKALI CYANIDES. N. Caro, 97, Hohenzollerndamm, Dahlem, Berlin, and A. R. Frank, 138, Kurfürstendamm, Halensee, Berlin. International Convention date, January 30, 1929.

Humic acid or vegetable matter which contains, or produces, or resembles humic acids, is subjected to slight oxidation by air at 50°—300° C. and the material is treated simultaneously or subsequently with ammonia. The process is applicable to peat, brown coal, decayed wood, sawdust, etc., which may be suspended in water. Positive catalysts such as alkali metal salts, alkaline earth salts, or heavy metal salts, or negative catalysts such as metal oxides, hydroxides, or carbonates may be added to regulate the speed of oxidation. The materials may be treated in suspension in water or other liquids, and the products may be heated with alkali hydroxides or carbonates in the absence of air at temperatures above 700° C. to obtain alkali cyanides.

347,644. ACID RESISTING APPARATUS. Compagnie Nationale de Matières Colorantes et Manufacture de Produits Chimiques du Nord Réunies, Etablissements Kuhlmann, 11, Rue de la Baume, Paris. International Convention date, January 31, 1929.

Apparatus required to resist substances such as phosphoric acid is constructed of carbon built up in sections, and the joints filled with a carbonaceous paste. Pulverulent or granular carbon is mixed with a carbonizable binder, moulded, and baked.

Specifications Accepted with Date of Application

352,474. Acetals, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). April 4, 1930.

352,476. Manures, Manufacture of. J. I. Bronn and Concordia Bergbau Akt.-Ges. April 4, 1930.

352,477. Sulphur from sulphide minerals, Process of recovering. Patent-aktiebolaget Grondal Ramen, and N. E. Lenander. April 5, 1930.

352,512. Separation of the oxidation products of solid hydrocarbons, waxes, and like materials. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). January 13, 1930.

352,517. Amides, Production of. Soc. Française de Catalyse Generalisée. December 7, 1929.

352,537. Alcohols, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). April 11, 1930.

352,549. Natural rubber and artificial rubber-like masses, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). April 12, 1930.

352,568. α-Naphthol, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). April 16, 1930.

352,580. Reducing ores with gases, Method of. F. M. Wiberg. July 6, 1929.

352,585. Acetic acid and other lower aliphatic acids, Concentration of. Cellulose Acetate Silk Co., Ltd., and D. Hayes. April 24, 1930.

352,597. Halogenated cyclic ketones of the acenaphthene series, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*). April 30, 1930. Addition to 33654/29.

352,626. ω-Aminomethyl-benzanthrone, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 12, 1930. Addition to 249,883.

352,639. Copper-silicon-zinc alloys. Hirsch, Kupfer und Messingwerke Akt.-Ges. February 13, 1930.

352,644. Meta-hydroxy-diarylamine carboxylic acids, Manufacture of. W. W. Groves. *I.G. Farbenindustrie Akt.-Ges.*). May 20, 1930. Addition to 29,433/29.

352,647. Continuous production of esters of ethyl alcohol, Process and apparatus for. Holzverkohlungs Industrie Akt.-Ges. July 23, 1929.

352,651. Extraction of ethylene glycol or its homologues. Chemische Fabrik Kalk Ges. and H. Oehme. May 24, 1930.

352,652. Oxidisable organic compounds. Goodyear Tire and Rubber Co. August 27, 1929.

352,663. Hydrogenation of aromatic compounds. Boots Pure Drug Co., Ltd. and J. Marshall. May 28, 1930.

352,671. Purifying or refining non-ferrous metals and alloys, Process of. D. R. Tullis and P. Oakley. June 4, 1930.

352,672. Low-boiling oils from solid carbonaceous materials, Method of obtaining. Standard Oil Development Co. June 25, 1929.

352,688. Acetylene by pryogenation of methane gas, Manufacture of. Soc. Industrielle des Hydrocarbures et Dérivés. June 19, 1929.

352,725. Tri-ammonium phosphate, Manufacture of. E. Urbain. May 8, 1930.

352,739. Fertiliser manufacture. Imperial Chemical Industries, Ltd. July 15, 1929.

352,746. Treating rubber. Roessler and Hasslacher Chemical Co. August 2, 1929.

352,759. Metal alloys. C. Vangrevenynge and Soc. Les Fils de V. Bidault et Cie. January 7, 1930.

352,781. Rubber, Manufacture of. Imperial Chemical Industries, Ltd. August 22, 1929.

352,802. Chloropropionic esters, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). September 8, 1930.

352,814. Ammonium phosphate, Production of. Kunstdunger-Patent-Verwertungs Akt.-Ges. October 5, 1929.

352,842. Pure high grade vinyl chloride, Production of. I.G. Farbenindustrie Akt.-Ges. October 18, 1929.

352,850. Reactivation of catalyst used in the destructive hydrogenation of hydrocarbon oils. Standard Oil Development Co. November 13, 1929.

352,878. Polyazo dyestuffs, Manufacture of. J. R. Geigy Akt.-Ges. November 29, 1929. Addition to 36,016/30.

352,881. Refractory products from magnesium silicates, Manufacture of. Metallges Akt.-Ges. and V. M. Goldschmidt. July 7, 1930.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Akabori, S., and Numaro, S. Method of preparing imidazolyl-propionic acid from glutamic acid. 21,201. July 24.

Barrett Co. Production of motor benzol. 21,209. July 24. (United States, July 30, 1930.)

Branscombe, D. J. Manufacture of 5-nitro- and 5-hydroxyacenaphthene. 21,103. July 23.

Carpmael, A. (I.G. Farbenindustrie Akt.-Ges.) Manufacture of indophenols of naphthocarbazole series, etc. 21,206. July 24.

Coley, H. E. Production of volatile metals from ores, oxides, etc. 21,088. July 23.

Compagnie Nationale de Matières Colorantes et Manufactures de Produits Chimiques du Nord Réunies Etablissements Kuhlmann. Sulphonated condensation products. 20,867. July 21. (France, September 24, 1930.)

Du Pont de Nemours and Co., E. I. Process of hydrating hydrocarbons. 21,158. July 24. (United States, November 11, 1930.)

—— Organic compounds. 21,159. July 24. (United States, October 22, 1930.)

—— Preparing substances from halogen-substituted butadienes. 21,160. July 24. (United States, February, 1928.)

—— Manufacture of synthetic rubber. 21,161. July 24. (United States, May 14.)

Goldberg, A. A., and Thorpe, J. F. Manufacture of anthraquinone derivatives. 21,145. July 24.

Groves, W. W. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of condensation products from quinones and aromatic nitroso-compounds. 20,833. July 21.

—— Simultaneous devlopment to different gradations of several silver halide emulsion layers. 20,834. July 21.

I.G. Farbenindustrie Akt.-Ges. Manufacture of indo phenols of naphtho-carbazole series, etc. 21,206. July 24.

—— Production of porous building material. 20,712. July 20. (Germany, July 29, 1930.)

—— Manufacture of esters of oxyacylaminobenzene arsonic acids. 20,764. July 20. (Germany, July 19, 1930.

—— Production of forgings of magnesium, etc. 20,804. July 21. (Germany, August 16, 1930.)

—— Manufacture of 2-oxyacetic acid-benzimidazole arsonic acids. 20,951. July 22. (Germany, July 22, 1930.)

Imperial Chemical Industries, Ltd., and Thorpe, J. F. Manufacture and use of colouring matters. 20,871. July 21.

—— Manufacture of rubber. 21,101. July 23. (United States, July 24, 1930.)

—— and Wray, E. C. Manufacture of 5-nitro-and 5 hydroxyacenaphthene. 21,103. July 23.

—— Degreasing materials. 21,253. July 24.

Johnson, J. Y. (I.G. Farbenindustrie Akt.-Ges.) Manufacture of non-splintering glass-like substances. 20,952. July 22.

—— Separation of paraffin wax from products containing same. 20,953. July 22.

—— Manufacture of condensation products. 20,954. July 22.

Kane, T., and Strange, E. H. Manufacture of alkyl chlorides, etc., from olefines. 20,715. July 20.

—— Manufacture of esters. 20,716. July 20.

—— Manufacture of vinyl esters and ethylidene compounds. 20,717. July 20.

Lantz, R. Manufacture of sulphides of nitro-aminodiphenyl, etc. 21,337. July 25. (France, August 8, 1930.)

—— Manufacture of aminothiophenols. 21,338. July 25. (France, August 1, 1930.)

Lehrecke, H., and Metallges Akt.-Ges. Production of solid diammonium phosphate, etc. 21,314. July 25.

Linstead, R. P. Manufacture and use of colouring matters. 20,871. July 21.

Mentzel, A. Manufacture of soda, ammonium chloride, nitrate of soda, and hydrochloric acid. 21,238. July 24. (Germany, August 15, 1930.)

—— Manufacture of ammonia. 21,239. July 24. (Germany, August 15, 1930.)

Norddeutsche Affinerie. Recovery of pure salts of nickel or cobalt. 20,995. July 22. (Germany, September 9, 1930.)

Oberschlesischer Berg-und Huttenmännischer Verein E. V. Obtention of phenols from coal tars. 20,737. July 20. (Germany, July 22, 1930.)

—— Process for obtention of phenols from coal, etc. 20,962. July 22. (Germany, July 22, 1930.)

Pallemaerts, F. A. F., and Union Chimique Belge Soc. Anon. Manufacture of nitric acid by oxidation of ammonia. 21,095. July 23.

Paper Maker Chemical Corporation. Method of making paper. 21,203. July 24. (United States, July 25, 1930.)

Peroxydwerk-Siesel Akt.-Ges. Production of hydrogen peroxide. 20,939. July 22. (Germany, July 25, 1930.)

—— Production of hydrogen peroxide. 20,984. July 22. (Germany, August 25, 1930.)

Rinman, E. L. Method of burning barium carbonate to oxide. 21,283. July 25.

Schering-Kahlbaum Akt.-Ges. Manufacture of 3-menthene. 20,864. July 21. (Germany, August 2, 1930.)

Soc. Anon. des Matières Colorantes et Produits Chimiques de Saint-Denis. Manufacture of sulphides of nitro-amino-diphenyl, etc. 21,337. July 25. (France, August 8, 1930.)

—— Manufacture of aminothiophenols, etc. 21,338. July 25. (France, August 1, 1930.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£18 15s. per ton d/d address U.K. in casks.
ACID CHROMIC.—11d. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity: ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3½d. per lb. ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
SALAMMONIAC.—Firsts lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ½d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
SODIUM CHLORATE.—2½d. per lb.
SODIUM CHROMATE.—3½d. per lb. d/d U.K., or 3½d. c.i.f. export.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in free drums. Crystals—Spot, £8 5s. per ton, d/d in free casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4½d. to 6½d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 2s. 2d. to 2s. 3d. per gall. Pale, 98%, 1s. 7d. to 1s. 8d. Dark, 1s. 4d. to 1s. 4½d.
ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4¾d. per gall.
BENZOLE.—Prices at works: Crude, 5½d. to 6½d. per gall.; Standard Motor, 1s. to 1s. 1d. per gall. 90%.—1s. 1d. to 1s. 2d. per gall. Pure, 1s. 4d. to 1s 5d. per gall.
TOLUOLE.—90%, 1s. 8d. to 1s. 9d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall.
XYLOL.—1s. 7d. to 1s. 8d. per gall. Pure, 1s. 10d to 1s. 11d. per gall.
CREOSOTE.—Standard specification, for export, 5dd. to 5¼d. net per gall. f.o.b.; for Home, 3¾d. per gall. d/d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.
NAPHTHALENE.—Purified Crystals, £10 per ton.
PITCH.—Medium soft, 50s. per ton, in bulk at makers' works.
PYRIDINE.—90/140, 3s. to 3s. 3d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
ACID ANTHRANILIC.—6s. per lb. 100%.
ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE.—£74 per ton d/d.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7½d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—8½d. per lb.
R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.
SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £12 per ton. Liquor, 9d. per gall.
ACETONE.—£63 to £65 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
WOOD TAR.—£4 to £5 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3d. to 4d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity: drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4½d. to 5½d. per lb.; Dark, 4½d. to 4¾d. per lb.
LAMP BLACK.—£28 per ton, barrels free.
LITHOPONE, 30%.—£18 to £20 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 4d. to 6s. 10d. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4½d. to 1s. 6d. per lb.

ACID, ACETIC, PURE, 80%.—£37 5s. per ton d/d address U.K. in casks.

ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.

ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—10¾d. per lb., less 5%.

ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots; Resublimed, 8s. 6d. per lb. for 28-lb. lots, d/d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—10¾d. per lb., less 5%.

AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.

AMMONIUM BENZOATE.—3s. 6d. per lb.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—2s. 10d. per lb.

BISMUTH CARBONATE.—7s. 9d. per lb.

BISMUTH CITRATE.—8s. 7d. per lb.

BISMUTH SALICYLATE.—7s. 11d. per lb.

BISMUTH SUBNITRATE.—6s. 9d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 6d. per lb.

BISMUTH OXIDE.—10s. 9d. per lb.

BISMUTH SUBCHLORIDE.—10s. 5d. per lb.

BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2½d. per lb.; 6 W. Qts., 1s. per lb.; 12 W. Qts., 10½d. per lb.; 36 W. Qts., 10d. per lb.

BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.

CAFFEIN, PURE.—6s. 6d. per lb.

CAFFEIN CITRAS.—5s. per lb.

CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.

CAMPHOR.—Refined flowers, 2s. 8d. to 2s. 10d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.

CHLOROFORM.—2s. 3d. to 2s. 6d. per lb., according to quantity.

ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.

GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.

HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.

HYDROQUINONE.—4s. 7d. per lb. in 1-lb. lots; 3s. 5½d. per lb. in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.

IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz.

MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.

MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 14s. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 9s. 9d. per lb., according to quantity; Liquid (95%), 8s. per lb.

MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 7s 4d. to 7s. 5d. per lb., levig., 6s. 11d. to 7s. per lb.; Corrosive Sublimate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 3d. to 5s. 4d. per lb.; White Precipitate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 11d. to 6s. per lb.; Calomel, 6s. 3d. to 6s. 4d. per lb.; Yellow Oxide, 6s. 9d. to 6s. 10d. per lb.; Persulph, B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 6s. 5d. to 6s. 6d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 4d. per lb.

PARAFORMALDEHYDE.—1s. 6d. per lb.

PARALDEHYDE.—1s. 1d. per lb.

PHENACETIN.—3s. 9d. to 4s. 1d. per lb.

PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—78s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.

POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.

POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.

POTASSIUM METABISULPHITE.—50s. per cwt. d/dLondon, kegs free.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.

SACCHARIN.—43s. 6d. per lb.

SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.

SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.

SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.

SODIUM BENZOATE B.P.—1s. 6½d. to 1s. 7½d. per lb.

SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb. for 28-lb. lots.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net, ton lots, d/s of 5 cwt. Crystals, 2s. 6d. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.

STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.

TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.

THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.

ZINC STEARATE.—1s. 4d. to 1s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—8s. 9d. per lb.

AMYL ACETATE.—2s. 3d. per lb.

AMYL BUTYRATE.—4s. 9d. per lb.

AMYL CINNAMIC ALDEHYDE.—8s. 6d. per lb.

AMYL SALICYLATE.—2s. 6d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE ALCOHOL.—1s. 9d per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.

BENZYL BENZOATE.—2s. 2d. per lb.

CINNAMIC ALDEHYDE NATURAL.—11s. 9d. per lb.

COUMARIN.—12s. per lb.

CITRONELLOL.—7s. 3d. per lb.

CITRAL.—6s. per lb.

ETHYL CINNAMATE.—6s. 9d. per lb.

ETHYL PHTHALATE.—2s. 6d. per lb.

EUGENOL.—7s. 6d. per lb.

GERANIOL.—6s. to 10s. per lb.,

GERANIOL (FROM PALMAROSA).—14s. per lb.

HELIOTROPINE.—5s. 6d. per lb.

ISO EUGENOL.—9s. per lb.

LINALOL (EX BOIS DE ROSE).—5s. 6d. per lb.

LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.

METHYL ANTHRANILATE.—6s. per lb.

METHYL BENZOATE.—4s. 3d. per lb.

MUSK XYLOL.—6s. 6d. per lb.

PHENYL ETHYL ACETATE.—10s. per lb.

PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.

RHODINOL.—40s. per lb.

SAFROL—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.

BERGAMOT OIL.—8s. 6 d. per lb.

BOURBON GERANIUM OIL.—17s. 6d. per lb.

CAMPHOR OIL.—White, 100s. per cwt.; Brown, 100s. per cwt.

CANANGA.—Java, 7s. per lb.

CINNAMON OIL LEAF.—4s. per oz.

CITRONELLA OIL.—Java, 2s. 6d. per lb., c.i.f. Pure Ceylon, 2s. per lb.

CLOVE OIL, 90/92%.—6s. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%—1s. 4d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb

LEMON OIL.—4s. 3d. per lb.

LEMONGRASS OIL.—2s. 9d. per lb.

ORANGE, SWEET.—8s. per lb.

OTTO OF ROSE.—Anatolian, 40s. per oz.; Bulgarian, 60s. per oz.

PALMA ROSA.—8s. 9d. per lb.

PETITGRAIN.—5s. 9d. per lb.

SANDALWOOD.—Mysore, 28s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, July 30, 1931.

A STEADY call for a number of chemical products has been received during the current week, with price fluctuations extremely small. Markets on the whole continue steady.

General Chemicals

ACETONE.—A fair average of business has been received with the market unchanged at £60 to £63 per ton, according to quantity.

ACID ACETIC.—Prices have been adjusted to £34 5s. to £36 5s. for technical 80% and £35 5s. to £37 5s. for pure 80%, with the demand of a brisk nature.

ACID CITRIC.—Has been in quiet request with the price unchanged at 11¼d. per lb., less 5%.

ACID FORMIC.—Continues steady at £37 per ton, with a fair demand.

ACID LACTIC.—Continues to meet with a satisfactory demand, with the 50% by weight pale quality quoted at about £38 per ton.

ACID OXALIC.—The market is firm at £34 per ton in casks, and £35 per ton in cwt. kegs, carriage paid, with a good demand.

ACID TARTARIC.—Rather a stronger demand has been received for this product with the price unchanged at 10¾d. per lb., less 5%.

ALUMINA SULPHATE.—In quiet request at £7 5s. to £8 5s. per ton, for 17/18% iron free quality.

ARSENIC.—Supplies of Cornish material remain extremely scarce for early delivery and the price is nominal at about £20 per ton. Imported material is on offer in larger supplies at about £19 to £19 10s. per ton.

CREAM OF TARTAR.—Continues in quiet demand at about £78 to £79 per ton at London.

COPPER SULPHATE.—A steady demand has been received and the market is about unchanged at £19 10s. per ton.

FORMALDEHYDE.—The market is unchanged at about £28 per ton and there has been a steady demand.

LEAD ACETATE.—In quiet request, with white quoted at about £31 15s. per ton, brown £30 15s. per ton.

LITHOPONE.—Steady at about £18 to £22 per ton, according to grade and quantity.

POTASSIUM BICHROMATE.—Unchanged at 4¼d. per lb.

POTASSIUM CHLORATE.—In good demand at £28 to £32 per ton, with the market firm.

PERMANGANATE OF POTASH.—In better demand, with the market firm at 5¼d. to 5½d. per lb., ex warehouse London for B.P. needle crystals.

SODIUM BICHROMATE.—Quoted at 3½d. per lb., with discounts for contracts, and there is a fair amount of business being placed.

SODIUM HYPOSULPHITE.—Commercial crystals in fair demand at about £8 10s. per ton, with photographic crystals in good request at £14 5s. per ton.

SODIUM PRUSSIATE.—Continues to be strongly held at 4½d. to 5¼d. per lb.

TARTAR EMETIC.—Steady at about 10½d. per lb. and in quiet request.

ZINC SULPHATE.—In better demand and unchanged at £10 10s. per ton.

Coal Tar Products

THERE is no change to report in the coal tar products market from last week, and prices remain unaltered.

MOTOR BENZOL.—Quoted at about 1s. 4½d. to 1s. 5½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Remains at about 1s. 1½d. to 1s. 2d. per gallon, f.o.r.

HEAVY NAPHTHA.—Unchanged at about 11d. to 1s. 0½d. per gallon, f.o.r.

CREOSOTE OIL.—Worth about 3d. to 3½d. per gallon, f.o.r. in the North, and about 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Remains at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Quoted at about £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.

PITCH.—Worth about 45s. to 47s. 6d. per ton, f.o.b. East Coast Port, for forward delivery.

Nitrogen Fertilisers

Sulphate of Ammonia.—British sellers of sulphate of ammonia have now announced the price of £6 10s. per ton for neutral sulphate of ammonia, basis 20·60 per cent. nitrogen, for delivery in six ton lots, carriage paid to buyers' nearest station, up to June 3, 1932, but reserve to themselves the right to raise or reduce this price at any time without notice.

Latest Oil Prices

LONDON, July 29.—LINSEED OIL was quiet and 2s. 6d. to 5s. down. Spot, £18 5s., ex mill. August, £16 5s.; September to December, £16 10s.; and January to April, £17 7s. 6d., naked. RAPE OIL was slow. Crude extracted, £26; technical refined, £27 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £19; refined common edible, £22; and deodorised, £24, naked, ex mill. TURPENTINE was quiet. American spot, 47s.; September to December, 39s. 6d. per cwt.

HULL.—LINSEED OIL, spot to December, closed at £17, naked; January to April at £17 7s. 6d. COTTON OIL, Egyptian, crude, spot, £18 10s.; edible, refined, spot, £21 5s.; deodorised, £23 5s. PALM KERNEL OIL, crude, naked, f.m.q., spot, £20. GROUNDNUT OIL, crushed extracted, spot, £24; deodorised, £28. RAPE OIL, crushed extracted, spot, £25 10s.; refined, £27 10s. SOYA OIL, crushed extracted, spot, £17 10s.; deodorised, £21 per ton. COD OIL, 18s. per cwt. TURPENTINE, spot, 49s. 6d. per cwt. CASTOR OIL, pharmacy, spot, 40s. 6d.; firsts, 35s. 6d.; seconds, 33s. 6d. per cwt.

South Wales By-Products

THERE is scarcely any change to report in South Wales by-product activities. Pitch continues to have a slow, sporadic call. All the big users are confining their buying to small, prompt parcels, while the general buying is almost negligible. Values are unchanged. Refined tars are brighter, both coke-oven and gasworks tar having a fair call. Road tar is unchanged, there being a steady but moderate call round about 13s. per 40-gallon barrel. The call for solvent naphtha remains small and uncertain, while heavy naphtha has practically no demand. Patent fuel and coke exports continue to be unsatisfactory. Patent fuel prices, for export, are:—19s. 9d. to 20s., ex-ship Cardiff; 19s. to 19s. 6d., ex-ship Swansea. Coke prices are:—Best foundry, 32s. 6d. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

MANY inquiries are in circulation but few orders are being received. Quotations reflect the depression apparent in practically all products.

Cresylic Acid.—Some business has been arranged at keen prices. Meantime values are easy. Pale, 99/100%, 1s. 5d. to 1s. 6d. per gallon; pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 3d. per gallon f.o.r. naked. High boiling remains scarce with price firm at 2s. to 2s. 6d. per gallon according to quality.

Carbolic Sixties.—Without interest at 1s. 1d. to 1s. 3d. per gallon according to percentage of water.

Creosote Oil.—A small but steady business is being conducted in the home market. Specification oils, 2¼d. to 3d. per gallon; washed oil, 3¼d. to 3½d. per gallon; gasworks ordinary, 3¼d. to 3¾d. per gallon; all f.o.r. in bulk.

Coal Tar Pitch.—Enquiries are numerous but few contracts have been placed. Export value is 40s. to 42s. 6d. per ton f.a.s. Glasgow, and home 37s. 6d. to 40s. per ton, ex makers' works.

Blast Furnace Pitch.—Quiet at controlled prices of 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Value is steady at 2¼d. to 2¾d. per gallon ex makers' works in buyers' packages.

Blast Furnace Tar.—Dull at 2¾d. per gallon f.o.r.

Crude Naphtha.—Supplies are scarce and value remains about 4¼d. to 5¼d. per gallon according to quality.

Water White Products.—Quotations are lower but buyers are scarce. Motor benzole is 1s. 3d. to 1s. 4d. per gallon; 90/160 solvent, 1s. 2d. to 1s. 3d. per gallon; and 90/190 heavy solvent, 1s. to 1s. 1d. per gallon; all in bulk.

Kerensky to Speak in London

THE Individualists are prompt in the field with their programme of activities for next winter. Two of their luncheons at least are likely to arouse considerable interest. In November Mr. Kerensky, the first revolutionary Russian Premier, will be the speaker, and he will be followed in January by Senator Corradini, the veteran leader of intellectual Facsism. Both statesmen will speak in their native languages, and in the case of Corradini the interpreter will be the Italian historian, Luigi Villari. Other speakers on the season's programme include Sir Michael Sadleir, Mr. John Buchan and Admiral Sir Roger Keyes.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, July 30, 1931.

GLASGOW Fair holidays continue to have an effect on the Scottish heavy chemical market, business still being dull.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £45 to £56 per ton; pure, £35 5s. per ton; technical, 80%, £34 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at 3¾d. per lb., ex store. On offer from the Continent at 3¾d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC. B.P. CRYSTALS.—Quoted 1s. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 11¾d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2¼d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £26 per ton, ex wharf. On offer for shipment from China at about £23 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £23 10s. per ton, ex wharf Spot material still on offer at £24 per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £29 per ton, ex store. Continental on offer at about £27 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £30 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £32 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 2s. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £24 10s. per ton ex store. Offered from the Continent at £23 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99½/100% POWDER.—Quoted £26 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6½d. per lb. ex wharf

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Nitrogenous Fertilisers in Italy

Growing Use of Calcium Nitrate

ITALIAN production of nitrogenous fertilisers, exclusive of calcium cyanamide, in 1930, was estimated by the Montecatini Co. at 181,436 tons, as compared with 166,032 tons in 1929. Of this quantity 130,800 tons were ammonia sulphate, and 39,300 tons were calcium nitrate. Domestic production of ammonium sulphate was in excess of home consumption in 1930, and, in addition, 21,143 tons of ammonium sulphate were imported, almost double 1929 imports. The Montecatini states that deliveries of domestic ammonium sulphate in Italy in 1930 did not exceed 105,655 tons, as against 122,660 tons in 1929. With a production of 130,800 tons, an outlet was sought for the surplus in exports. The Montecatini sold 35,709 tons for export, of which 16,691 were delivered.

The growing use of calcium nitrate in Italy is noteworthy. Sales of calcium nitrate on the home market reached 32,758 tons, as compared with 31,360 tons in 1929 and 12,000 tons in 1928. In addition to the calcium nitrate of domestic manufacture, 20,453 tons of this fertiliser were imported in 1930 as compared with 25,077 tons in 1929 and only 8,771 tons in 1928. The Montecatini states that its output of calcium nitrate during the current year will be intensified to cover completely the home demands. Consumption of imported nitrate of soda is estimated at 75,000 tons in 1930, as against 74,000 tons in 1929. The Merano plant operated during 1930 on a satisfactory basis. Some changes are now being introduced in this plant in order to produce a new fertiliser on a Fauser-Montecatini process, known as nitro-chalk. During the year the Crotone plants were enlarged so that they are now in a position to utilise electric power in excess of the quantity to be delivered from the Sila power plants from April of this year. The new plant at Crotone should be ready by the end of this year. The manufacture of ammonium phosphate at Crotone has been successfully begun, and the capacity of the synthetic ammonia plant at Novara has been doubled.

I.C.I. Wages

IN the summer number of the *I.C.I. Magazine*, Sir Harry McGowan announces that his colleagues and himself have decided to suggest to the Chemical and Allied Employers' Federation that the further reduction for shift men which is to be considered by the Joint Industrial Council in September, should be withdrawn for the time being.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, July 30, 1931.

It is still possible to point to one or two sections of the chemical market where the price tendency is not too strong, but apart from these, values are quite steady generally, with firmness apparent in a few instances. In by-products, especially, the comparative scarcity of crude tar is exercising a strengthening influence on some products. With regard to business on the Manchester market during the past week, this has been rather patchy and seasonal influences tend to restrict both the number of individual transactions and the aggregate quantities involved.

Heavy Chemicals

The demand for chlorate of soda this week has been on quiet lines but offers of this material are fully maintained at about £26 10s. per ton. There is a fair movement of caustic soda, principally against existing contracts, which are quoted at from £12 15s. to £14 per ton, according to quality. Bicarbonate of soda is in quietly steady demand and values are firm on the basis of £10 10s. per ton. No more than a quiet business has been reported this week in respect of hyposulphite of soda but prices are well held at from £15 to £15 10s. per ton for the photographic quality and about £9 5s. for the commercial material. Buying interest in the case of sulphide of sodium is slow still but there has been little alteration in price levels, the 60–65 per cent. concentrated solid quality being on offer at round £9 per ton and the commercial at £8. There is a moderate enquiry about for prussiate of soda and quotations are firm at from 4¾d. to 5¼d. per lb., according to quantity. Bichromate of soda is moving in fair quantities, with values on the basis of 3½d. per lb., less 1 to 2½ per cent. Interest in phosphate of soda this week has not been at all active and at £10 to £1; 10s. per ton for the dibasic quality prices are not too strong. A quietly steady business is reported in the case of alkali and prices are firm at £6 per ton. Saltcake is steady and in moderate request at up to £3 per ton.

Permanganate of potash is steady at round 5¼d. per lb. for the B.P. material and 5d. for the commercial, but current sales of this material are only on a limited scale. Yellow Prussiate of potash keeps fium at from 6¾d. to 7¼d. per lb., according to quantity, the demand being moderate. Chlorate of potash has been rather quiet but prices keep up in the neighbourhood of £27 10s. per ton. Carbonate of potash meets with a quiet demand, with values easy at from £24 to £24 10s per ton. Bichromate of potash keeps steady on the basis of 4¼d. per lb., less 1 to 2½ per cent. With regard to caustic potash, this is a quiet section of the market at about £27 10s. per ton.

Sulphate of copper is attracting relatively little attention at the moment and prices are easy at a top figure of about £18 10s. per ton, f.o.b. Arsenic continues in short supply and quotations are very firm at from £20 to £20 10s. per ton, at the mines, for white powdered, Cornish makes. Acetate of lime meets with a poor demand, with brown quoted at about £7 10s. per ton and grey at £12. The lead products are unchanged at round £29 per ton for nitrate and £32 10s. and £31 for white and brown acetate.

Acids and Tar Products

Lower rates are being indicated for both citric and tartaric acids and buying interest is restricted; current offers are at from 11d. to 11½d. and round 10½d. per lb., respectively. Oxalic acid is steady at about £1 14s. per cwt., ex store, but not a great deal of interest is being displayed. Acetic acid is firm at round £51 per ton for the technical glacial and about £37 for the 80 per cent. commercial.

Among the by-products, pitch is steady at from 42s. 6d. to 47s. 6d. per ton, f.o.b., with a moderate enquiry about. Creosote oil is slow but offers are maintained at from 3d. to 4d. per gallon, naked. Solvent naphtha is fractionally easier at down to 1s. 1d. per gallon, naked. Crude carbolic acid has firmed up a little to 1s. 3d. to 1s. 4d. per gallon, naked, for 60's, with crystals unchanged at 5d. to 5½d. per lb., f.o.b.

Company News

Chemical Bank and Trust Co. of New York.—The financial statement at June 30, 1931, shows capital, surplus and undivided profits of $65,260,926, deposits $379,776,335, and total assets $520,232,972.

British Bitumen Emulsions.—The report for the year 1930 states that the trading profit for the year amounted to £4,752, and after providing for directors' fees and depreciation there was a balance of £95, which the directors recommend be carried forward.

English Velvet and Cord Dyers' Association.—Interim dividends for the half year ended June 30, 1931, are announced, at the rate of 5 per cent. per annum on the cumulative preference shares, and 4 per cent. per annum on the ordinary shares, less tax.

Cellulose Acetate Silk Co., Ltd.—A net loss of £53,474 is shown in the accounts for the period from March 30, 1930, to March 28, 1931. For the previous period the loss was £65,747. The total debit on profit and loss account is £119,221. It is stated that the accounts would have shown a profit had the customer, who had entered into a large contract with the company for the purchase of an average quantity of 2½ tons per day of cellulose acetate, been able to accept delivery.

British Tintex and Dye Products.—The accounts for the fifteen months ended March 31, 1931, show a loss on trading amounting to £14,796, without providing for losses made by subsidiary companies, which amount in all to £5,336. Advertising expenditure carried forward at December 31, 1929, has been written off, and total debit balance carried forward on profit and loss account amounts to £33,307. The directors attribute the greater part of the loss for the period to the effect of agitation which originated in the early part of 1930 and continued until the end of the year. Following on arrangements made with J. C. Eno, Ltd., to act as sole selling agents for this country, sales have shown decided improvement, while costs of manufacture and overhead charges both at factory and head office have been considerably reduced. With regard to subsidiary companies, Pastex Dyes, Ltd., show loss of £94 for twelve months period to December 31 last. Loss to December 20 last (£5,242) of Dominion Tintex and Dye Products, Ltd., was due largely to conditions of trading in Australasia, but, in addition, it has been considered expedient to make drastic writing down of stocks. Directors are satisfied that all losses have been provided for, and that no further demands will be necessary on available cash resources of the parent company.

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

South Africa.—The South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg not later than September 21, for the supply and delivery of approximately 216,400 lbs. of carbide of calcium. (Ref. F.X. 1209.)

South Africa.—The City of Cape Town Electricity Department is calling for tenders, to be presented in Cape Town by September 2, for the supply of 1,000 gallons of terra cotta paint, in 5-gallon drums, suitable for painting electric light poles. (Ref. B.X. 7122.)

Turkey.—The Direction General of Military Factories, Ministry of National Defence, is calling for tenders, to be presented in Ankara by September 7, for the supply of:—3¼ tons of antimony (99 per cent. pure), (Ref. G.X. 10610); 6½ tons of nickel (99·5 per cent. pure), (G.X. 10611); 570 kilos of pure tin (99·5 per cent. pure), (G.X. 10608); 500 kilos of aluminium (99·5 per cent. pure), (G.X. 10607.)

Trade in British West Indies

A memorandum containing hints for commercial visitors to the British West Indies, prepared by H.M. Trade Commissioner in Trinidad, has been issued by the Department of Overseas Trade, 35, Old Queen Street, S.W.1. (Ref. C. 3583.)

Tariff Changes

PALESTINE.—The Palestine *Official Gazette* of June 16 contains a notice, dated June 10, providing for the exemption from payment of Customs duty on importation into Palestine of soda ash.

AUSTRALIA.—Import duty, under the British Preferential Tariff, for kaolin, suitable for use as a dry colour, appears in a recent decision issued by the Commonwealth Department of Trade and Customs at 3s. per cwt. or 20 cent. *ad valorem*.

GERMANY.—A Presidential Order, dated June 5, empowers the Government of the Reich, in case of urgent necessity, to regulate the Customs treatment of products containing nitrogen or phosphorus and intermediates thereof, which can be used as fertilisers. A Ministerial Order, dated July 13, issued under this Presidential Order, amends, as from July 15, the duties on certain of these products, as follows :—

Tariff No.	Article	Rate of Import Duty Former Reichsmarks per 100 kilos.	Revised Reichsmarks per 100 kilos.
271	Ammoniacal liquor (gas liquor); liquid ammonia	Free	8
274	Nitric acid	Free	12
286	Carbonate of ammonium	Free	20
ex 302	Nitrate of ammonia (ammonia saltpetre), not imported in shells or capsules	Free	24
303	Nitrate of soda (Chile saltpetre)	Free	12
ex 304A	Nitrate of potash	Free	24
304B	Ammonium chloride; sulphate of ammonia; nitrate of lime, even containing up to 8 per cent. of nitrate of ammonia; carbamide; calcium cyanamide	Mainly free	12
362A	Fertilisers containing phosphorus treated with acids (superphosphates) even mixed with other materials :—		
	Nitrogenous	0·50*	12*
	Other.....	0·50*	0·50*
362B	Nitrogenous manures, not specified or included elsewhere	Free	12
ex 379	Ammonia, anhydrous ..	8	12

* Duty-free under the Conventional Tariff.

Petroleum Refineries, Ltd.

IN the Chancery Division on Monday, July 27, Mr. Justice Maugham adjourned until the next sittings, the petition of Newall's Insulation Co., Ltd., Washington Station, Durham, for the compulsory winding-up of Petroleum Refineries, Ltd. Counsel for petitioners said they had received information upon which they thought they should agree to the petition being adjourned. Mr. Stafford Crossman said he appeared for the Admiralty, who were creditors for £13,000, and he supported the adjournment.

British Netherlands Artificial Silk Co.

SHAREHOLDERS of the British Netherlands Artificial Silk Company, which established an extensive factory at Wigton, Cumberland, but did not get production started, were on Tuesday, July 28, notified of a meeting to be held in London next week for the purpose of passing a resolution for voluntary liquidation. By the same post creditors have been informed that the directors were endeavouring to formulate a reconstruction scheme. This company was incorporated three years ago with an authorised share capital of £855,000, of which £419,905 was actually subscribed. The balance sheet issued in July, 1930, showed a loss of £23,900 from the period of incorporation.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

BONNAIRE, LTD., London, W., manufacturers of chemical products. (M., 1/8/31.) Registered July 17, debenture securing to H. Portlock, 9, Percy Street, London, £800 advanced to Bonnaire Deodoriser Co., Ltd.; charged on 5, Rathbone Place, W.; also general charge. *——. December 31, 1930.

Satisfactions

ALPHA SYNTHETICS, LTD., London, E.C., chemical merchants, etc. (M.S., 1/8/31.) Satisfaction registered July 21, £125; registered July 23, 1930.

APSLEE CO., LTD., Manchester, druggists. (M.S., 1/8/31.) Satisfaction registered July 16, £250, registered February 24, 1931.

DIVE (E. B.) AND CO., LTD., London, E., manufacturing chemists. (M.S., 1/8/31.) Satisfaction registered July 21, £3,000, registered October 23, 1928.

STEAROLENE, LTD., London, W.C., oil refiners. (M.S., 1/8/31.) Satisfaction registered July 21, all moneys, etc., registered January 18, 1930.

London Gazette, &c.

Companies Winding Up Voluntarily

BRITISH OIL AND LUBRICANTS, LTD. (C.W.U.V., 1/8/31.) By special resolution, July 21. Mr. R. Hanwell, 7, Carnwath Road, Fulham, London, S.W.6, appointed liquidator.

TEES SALT CO., LTD. (C.W.U.V., 1/8/31.) By special resolution, July 23. Mr. R. Brown Copeland appointed liquidator and authorised to distribute all or any of the assets of the company in specie among the contributories.

New Companies Registered

G. N. HIGGS (CHROMALOID), LTD.—Registered July 24. Nominal capital, £8,000 in £1 shares. To acquire the businesses carried on by G. N. Higgs at the Chromoloid Works, Oaklands Road, Cricklewood, and by the Chromettic Plating Co., Ltd., at the Palace of Industry, Wembley, and to carry on the business of electric deposition of chromium or cadmium or other metals, electrical, mechanical and general engineers, gold and silversmiths, etc. A subscriber: G. N. Higgs, 63, Oxgate Gardens, Cricklewood, London, N.W.2.

PEROKLEAN, LTD., 25, Broadway Buildings, Westminster, London, S.W.1. Registered July 25. Nominal capital, £750 in 1s. shares. To adopt an agreement with Perolin, Ltd., to acquire the business referred to therein, including the use of the trade marks for Peroklean, and to carry on the business of manufacturers of, agents for and dealers in cleansers, chemicals, dyes, soap, paint, varnish, wood preservatives and cleansing and disinfecting compounds, etc. Directors: A. Anns, H. F. Anns, E. W. R. Stapley.

Alliance Artificial Silk, Ltd.

Mr. Justice Maugham, in the Companies Court of the Chancery Division on Monday, adjourned until the second petition day next sitting, the petition of the Cellulose Acetate Silk Co., Ltd., of Lancaster, for the compulsory liquidation of Alliance Artificial Silk, Ltd.

Mr. Jenkins, K.C. (for the comapny), said the petition had been adjourned several times to give the company time to raise further capital, and he asked for a further adjournment for that purpose.

Mr. Linden, for a creditor, said he was satisfied that steps were being taken to raise fresh funds.

His lordship said over a million pounds was involved.